DATA SHEET & USER MANUAL

Module Number: IPT-914 / IPR-915

Product Family: Long-Range K-Band Barrier
Range of use: Security applications

Overall

- The InnoSenT K-Band Barrier consisting of Transmitter IPT-914 and Receiver IPR-915 is the new generation of long range 24GHz radar barriers for perimeter protection in the field of security.
- The sensor provides a special RF-Design for maximum sensitivity in long range applications.
- The programmable Tx/Rx-frequency and the switchable output powers (FCC/ETSI) gives the user new options in the installation of the module and stock keeping.
- The Barrier is delivered with the IPRO programming kit to program the TX/Rx-frequency.

  The programming kit “IPRO“ consists of:

  - programming software “IPRO“
  - programming adapter “IPRO“
  - USB-cable
  - ZIF-cable

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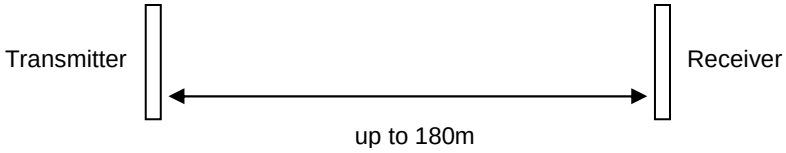
1. DATASHEET

Module Number: IPT-914 / IPR-915

1.1. Basic Features

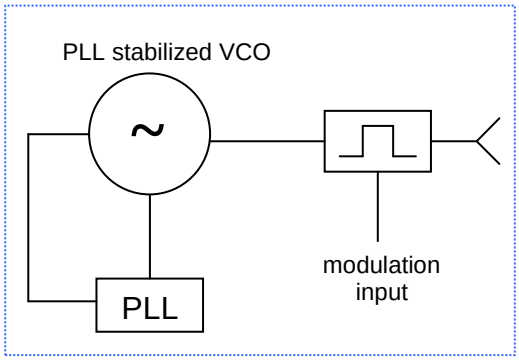
- radar-based barrier consisting of one Tx- and one Rx-Module.
- operating frequency: 24.000 – 24.250GHz (24GHz ISM Band).
- covered range up to 180m.



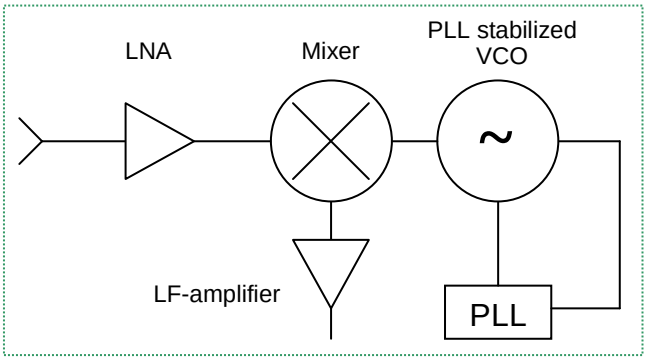
- integrated RF-pre-amplifier within the Rx-Module.
- integrated PLL-circuit for high frequency stability and low phase noise for the Tx- and Rx-Part.
- Tx- and Rx-frequencies are customer programmable.
- 2 selectable output power levels (ETSI / FCC) for the Tx-Module.
- the Tx-signal can be ASK-modulated up to 26kHz.

1.2. Concept Drawing

Tx - Part IPT-914



Rx - Part IPR-915



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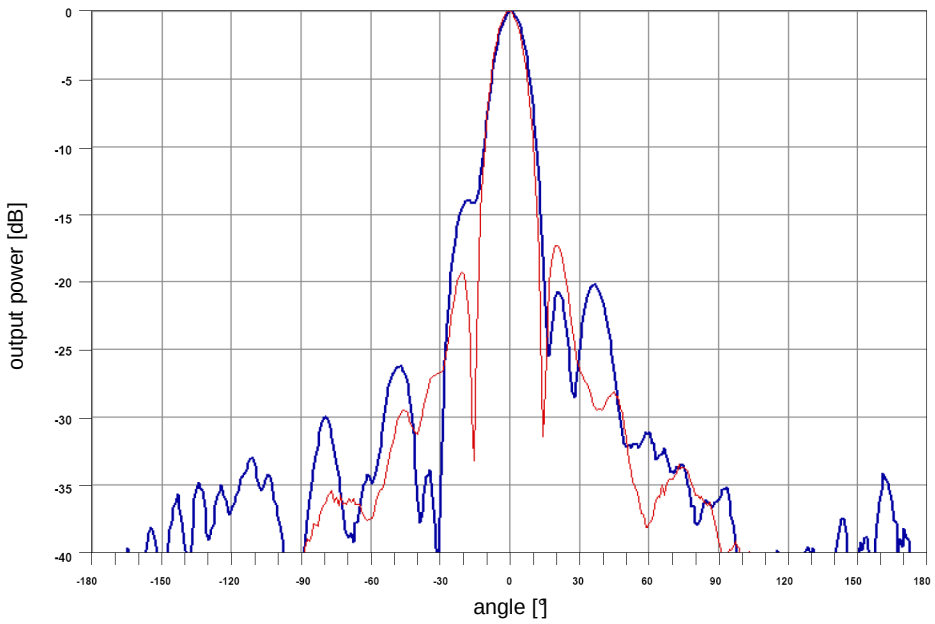
1.3. Electrical Characteristics

Parameter	Symbol	min.	typ.	max.	units	comment
Transmitter						
transmit frequency	f	24.000		24.250	GHz	programmable
channel spacing			5		MHz	
temperature drift frequency	Δf		< 10		kHz/℃	
output power (FCC)	P_{out_HIGH}		24		dBm	High-Power Mode
output power (ETSI)	P_{out_LOW}		20		dBm	Low-Power Mode
modulation frequency	f_{mod}			26	kHz	ASK-modulation
positive supply voltage	VCC		5		V	
positive supply current	ICC			140	mA	
Receiver						
transmit frequency	f	24.000		24.250	GHz	programmable
channel spacing			5		MHz	
IF-amplifier	gain		10		dB	
	bandwidth		5		MHz	
positive supply voltage	V_{CC}		5		V	
positive supply current	I_{CC}			140	mA	
Environment						
operating temperature	T_{OP}	-20		60	℃	
outline dimensions	65.8 x 70.0 x 9 (17.7)				mm	compare drawing
Antenna						
antenna pattern (-3 dB)	horizontal		13		°	azimuth
	vertical		13		°	elevation
side lobe suppression	horizontal		10		dB	azimuth
	vertical		10		dB	elevation

1.4. Antenna pattern



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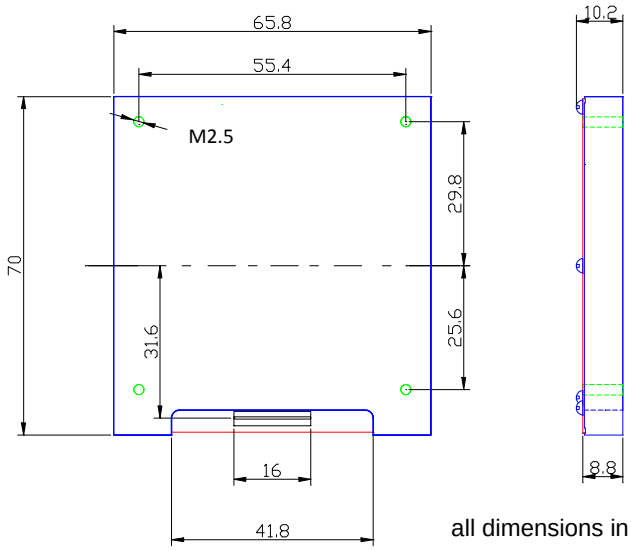
1.5. Mechanical Outlines



all dimensions in Millimeter

1.6. Interface

Connector: 14FMN-BMT-A-TF

Pin	Function	Description
Interface IPT-914		
1	Vcc	Power supply 5V
2	lock detect	low if PLL is unlocked ; 3.3V if PLL is locked
3	do not connect	
4	output power	low = 20dBm ; high = 24dBm ; open = high
5	mod. input	ASK modulation up to 26kHz
6	n.c.	
7	do not connect	
8	do not connect	
9	do not connect	
10	do not connect	
11	GND	Ground
12	n.c.	
13	do not connect	
14	do not connect	
Interface IPR-915		
1	Vcc	Power supply 5V
2	lock detect	low if PLL is unlocked ; 3.3V if PLL is locked
3	do not connect	
4	n.c.	
5	n.c.	
6	n.c.	
7	do not connect	
8	do not connect	
9	do not connect	
10	do not connect	
11	GND	Ground
12	IF output	IF output (5MHz)
13	do not connect	
14	do not connect	

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2. USER MANUAL

Module Number: IPT-914 / IPR-915

2.1. Adjustment of output power

The K-Band Barrier can be operated in two power settings.

An AGC (**A**utomatic **G**ain **C**ontrol) regulates the output power to 20dBm in LOW POWER mode and keeps it stable over temperature.

The HIGH POWER mode will suspend the AGC, which leads to an output power of typically 24dBm.

The desired operating mode can be adjusted through PIN 4 – LP of the sensor.

The following options are available:

- Low Power (AGC controlled) = PIN active LOW
- High Power = PIN active HIGH

The default – adjustment is HIGH (PIN open)

2.2. Programming of the transmit frequency with the programming-kit "IPRO"

The IPRO programming kit can be used for in-house programming of the transmit frequency.

The programming unit consists of the programming adapter, programming software and the USB cable.

In order to program the sensor you will have to follow the following action steps:

- Please install the IPRO Software to your PC:
  (Basic requirements are: Windows XP / USB 2.0 Interface)
  - Please insert provided CD in your CD-Drive.

Please note that you need Administrator Permission in order to install Drivers & Software

  - The installation Software starts automatically.
  - Please first install Drivers before installing the IPRO Software.
- Connect the IPRO programming-kit with the sensor via provided ZIF-cable
  (Please note that the ZIF-cable is connected properly to the correct socket)

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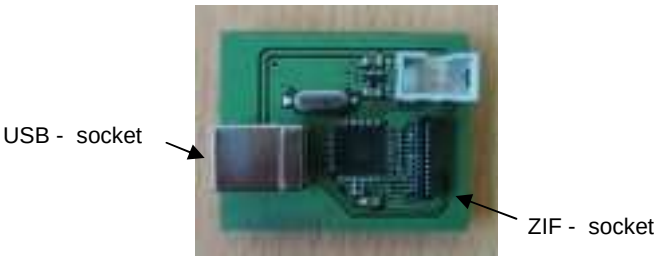
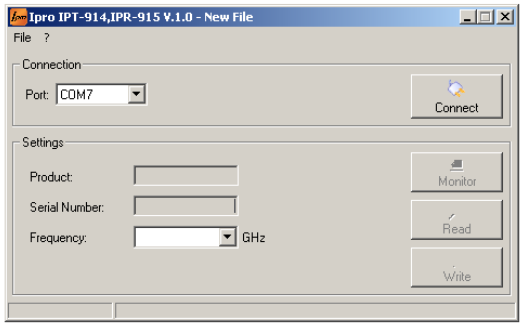


Picture 1: programming-kit

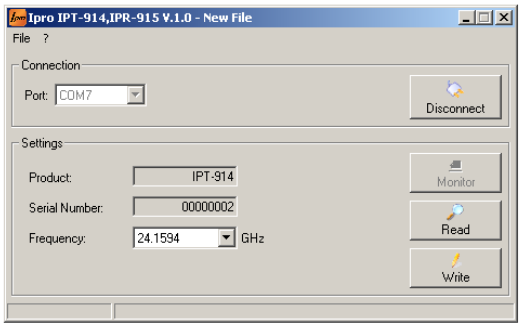
Please make sure that the USB-cable has a max. length of 1 meter!

- Please start IPRO Software



Picture 2: Programming user-interface

- Software:
  - The Software will automatically detect the USB Port used while starting.
  - In order to connect the PC with the programming kit please press the “Connect” button.
  - Pressing the “Read” button delivers information concerning the actual settings as well as the serial number of the connected module.
  - The desired frequency can be set via provided Pull-Down-Menus’.



Picture 3: Selection of transmit frequency and IF amplification

Due to the provided channel-spacing of 5 MHz intervals you can select the frequencies provided by the Pull-Down-Menu.

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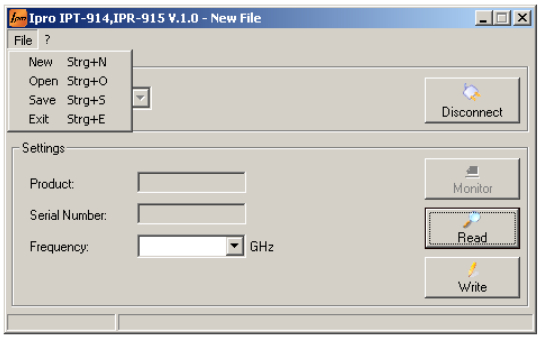
- The "Write" button saves the selected specifications to the sensor. Afterwards, the sensor automatically verifies the set specs. The progress of the action can be monitored via the status bar.

Picture 4: Status bar

- If no error message occurs the sensor has been programmed correctly.
- The programmed sensor is now ready for operation and the next module can be programmed.
- The selection of frequency is saved while changing the module. Therefore, you will not have to perform a new selection.
- The selected data can be stored by using the menu point "Save" or by pressing the buttons "Strg+S" together. This data can be used for future sensors that have to be set to the same transmit frequency.

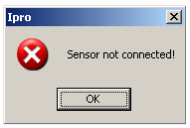


Picture 5: File Menu

- The connection can be cancelled by pressing the "Disconnect" button or "Strg+E" after finishing the task of programming sensors.

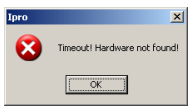
2.3. Troubleshooting

The following error messages can occur while programming:



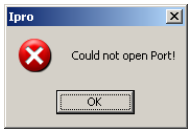
No sensor connected to the programming kit

↳ check ZIF-connection between sensor and programming kit



Software does not find the programming kit

↳ check USB connection between programming kit and PC



Port cannot be opened (e.g. Port is occupied by another device)

↳ you have to choose a port that is free

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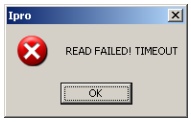
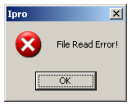


Data cannot be read from the sensor

↳ sensor has to be programmed again



Saved data is not readable

↳ check data-file

Provided data of sensor is faulty

↳ Sensor has to be programmed again

Error while writing data to the sensor

↳ Sensor has to be programmed again

Please contact InnoSenT directly in case of different errors occurring while using the adapter. You will find the contact details at the end of this user manual.

Certification and environment protection:

InnoSenT GmbH has established and applies a quality system for: Development, production and sales of radar sensors for commercial and industrial sensors

An audit was performed, Report No. 010350 Proof has been furnished that the requirements according to DIN EN ISO 9001:2000 are fulfilled.

This InnoSenT product is compliant to the restriction of hazardous substances (RoHs – European Union directive 2002/95/EG).

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